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Fujisawa

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(54) **COATING FILM TRANSFER TOOL**

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B65H 37/00 (2006.01)
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CPC ***B65H 35/0033*** (2013.01); ***B43L 19/0068*** (2013.01); ***B65H 16/005*** (2013.01); ***B65H 23/00*** (2013.01); ***B65H 37/007*** (2013.01); *B65H 2402/20* (2013.01); *B65H 2402/31* (2013.01); *B65H 2402/631* (2013.01); *B65H 2515/34* (2013.01)

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CPC B65H 35/0033; B65H 37/007; B65H 16/005; B65H 23/00; B65H 2402/31; B65H 2402/20; B65H 2515/34; B65H 2402/631; B43L 19/0068; B43L 19/00
See application file for complete search history.

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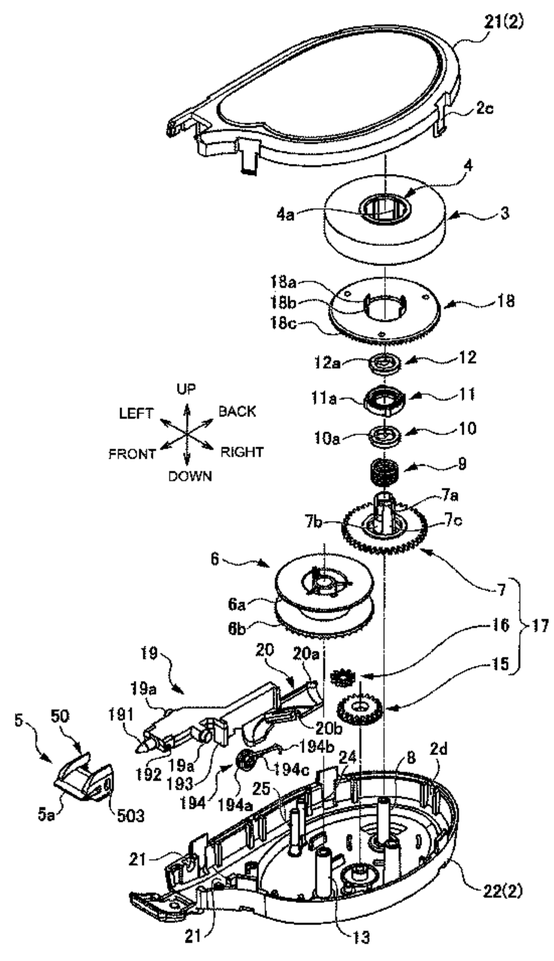
(57) **ABSTRACT**

A coating film transfer tool may include a casing that houses a feeding reel around which a transferable tape is wound and a winding reel; and a transfer head having a main body portion arranged in a front side which is one side of a front-rear direction of the casing to extend in a left-right direction perpendicular to the front-rear direction in a front end portion and provided with a pressing edge portion adapted for transferring the coating film to a transfer target surface. The casing or a base member housed in the casing may have a protruding tip that extends to the transfer head side and is connected to the transfer head. The protruding tip may press a part of an area including a center of the left-right direction of the main body portion to the transfer target surface side in the event of a transfer.

20 Claims, 9 Drawing Sheets



(51) **Int. Cl.**

B65H 19/00	(2006.01)
B65H 16/00	(2006.01)
B65H 23/00	(2006.01)
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Fig. 1

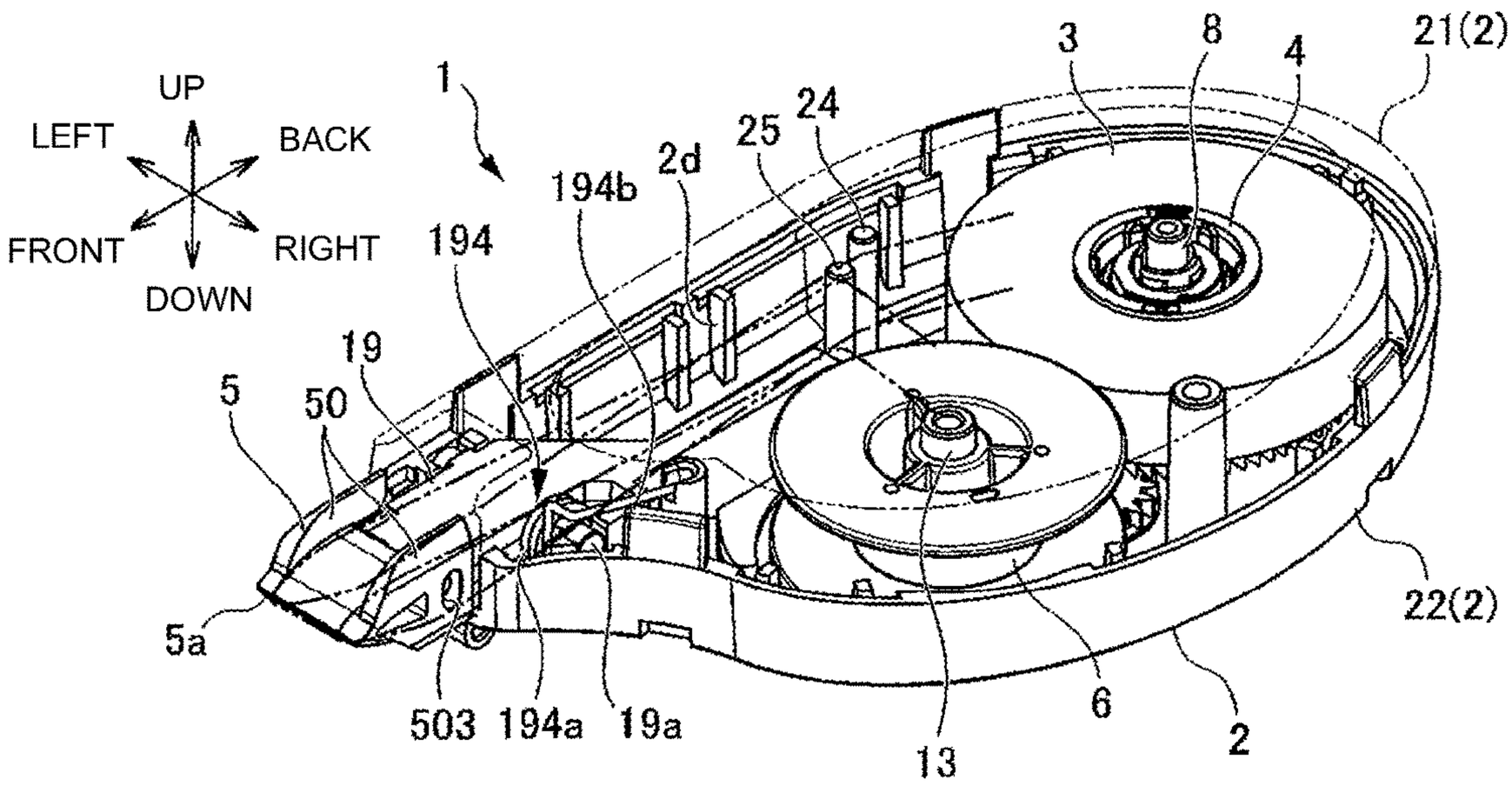
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Fig. 2

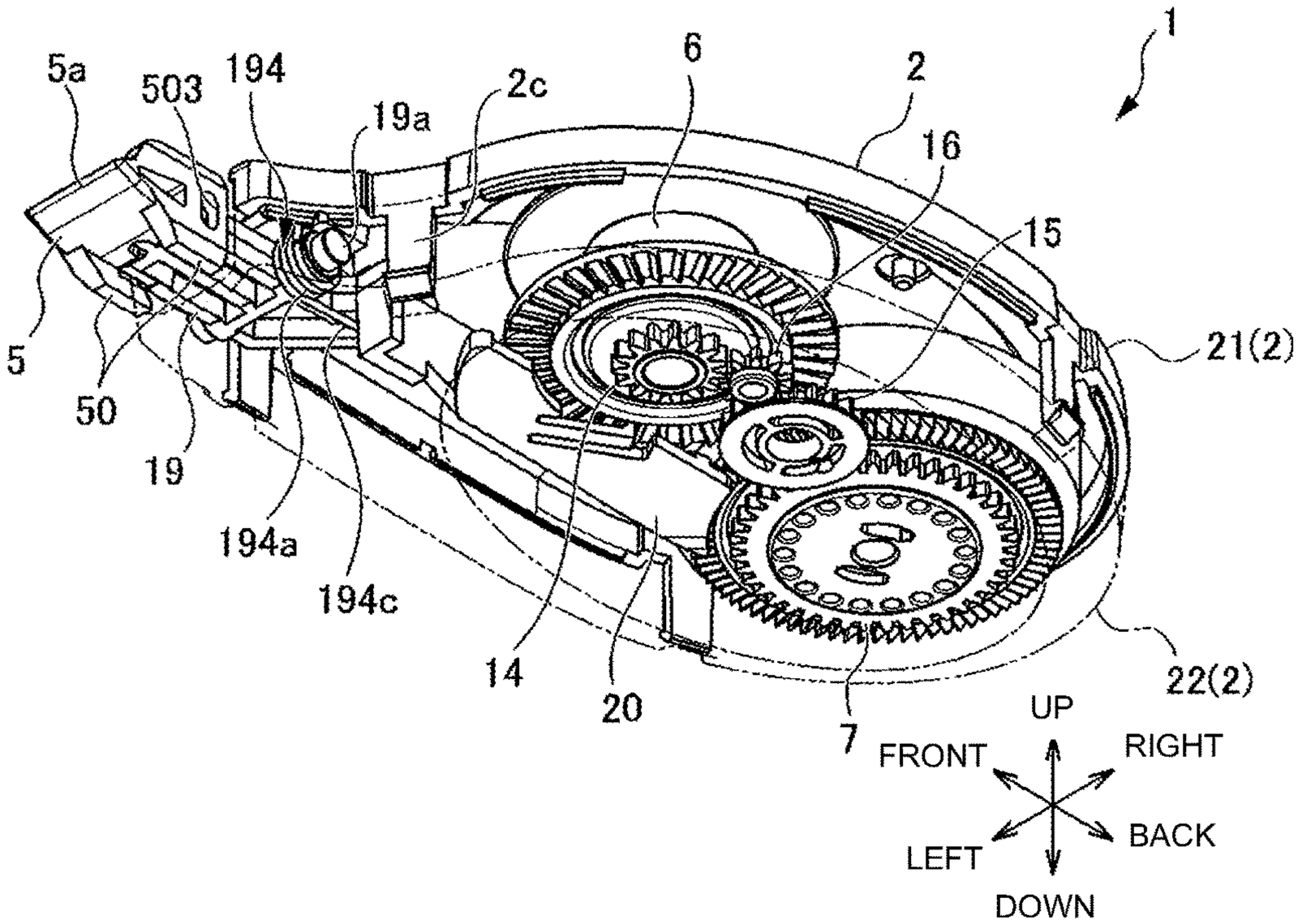
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Fig. 3

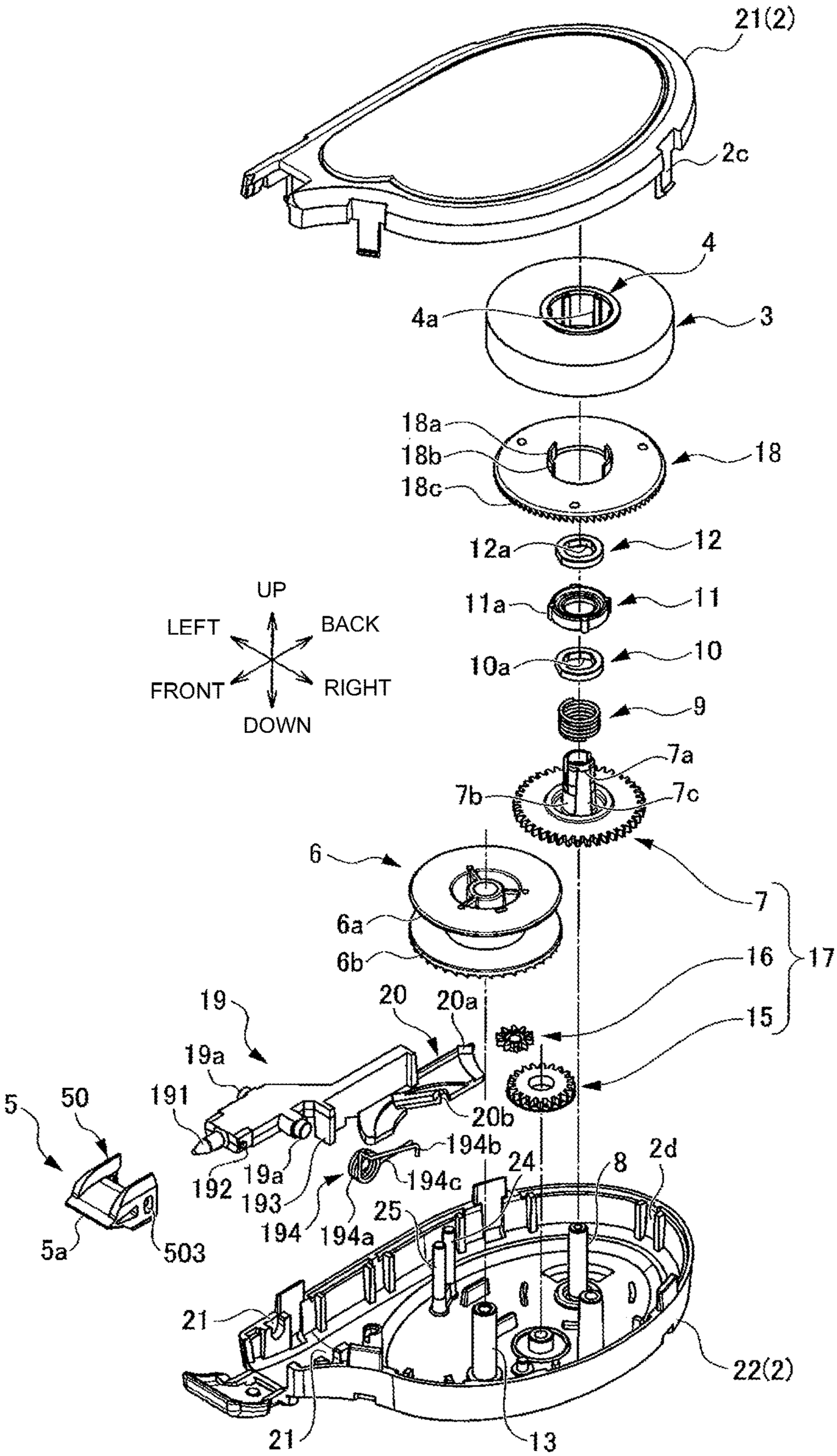
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Fig. 4

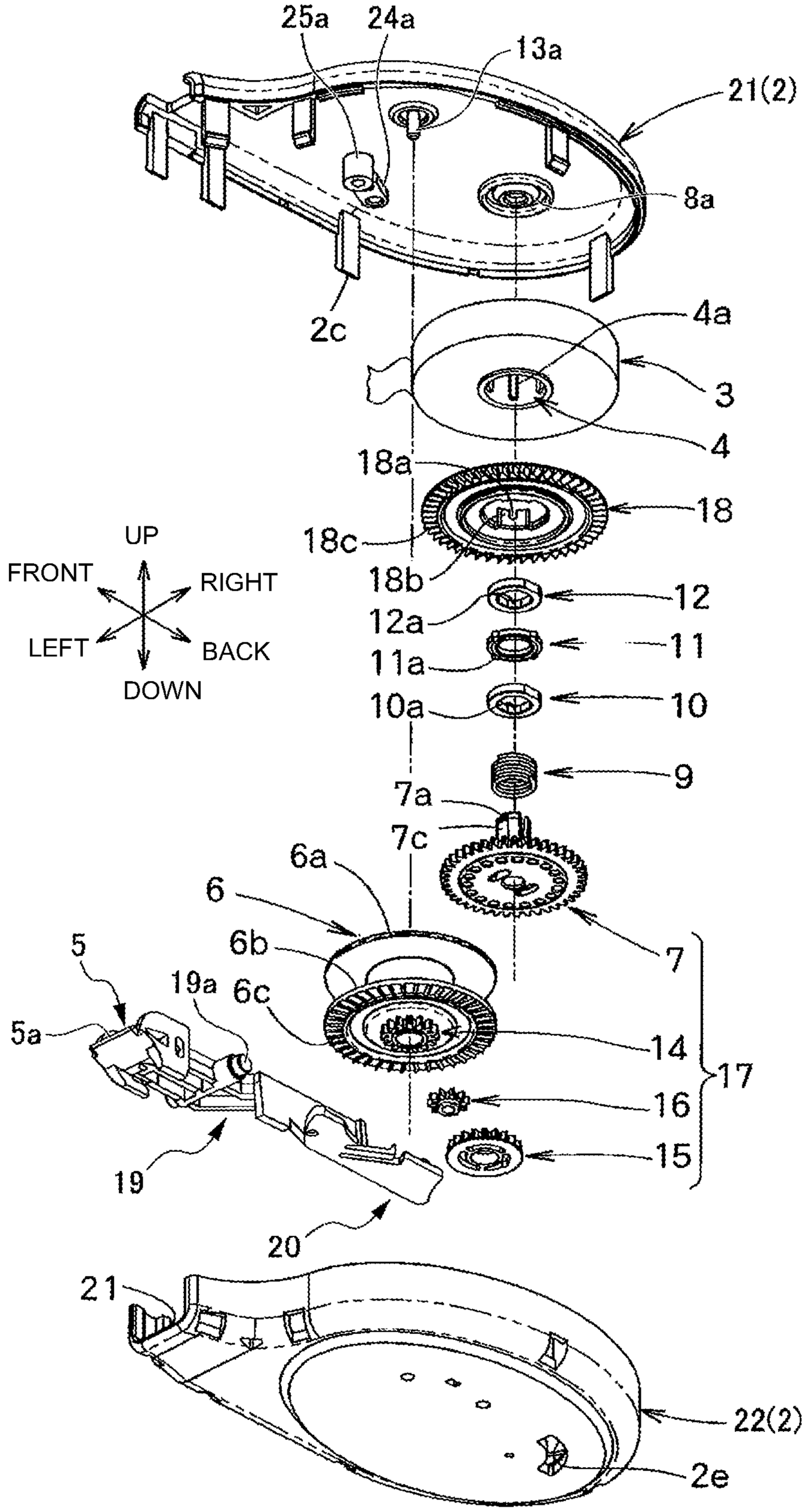
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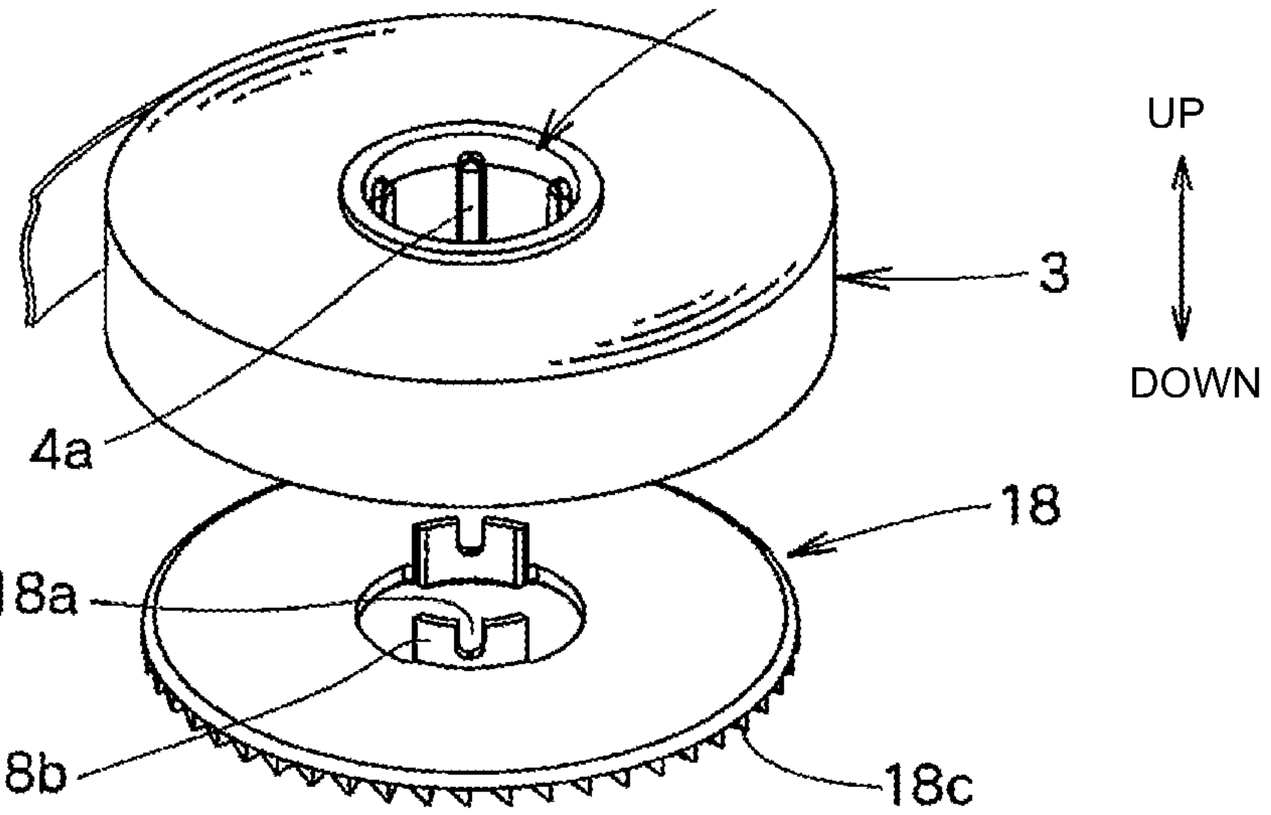
Fig. 5



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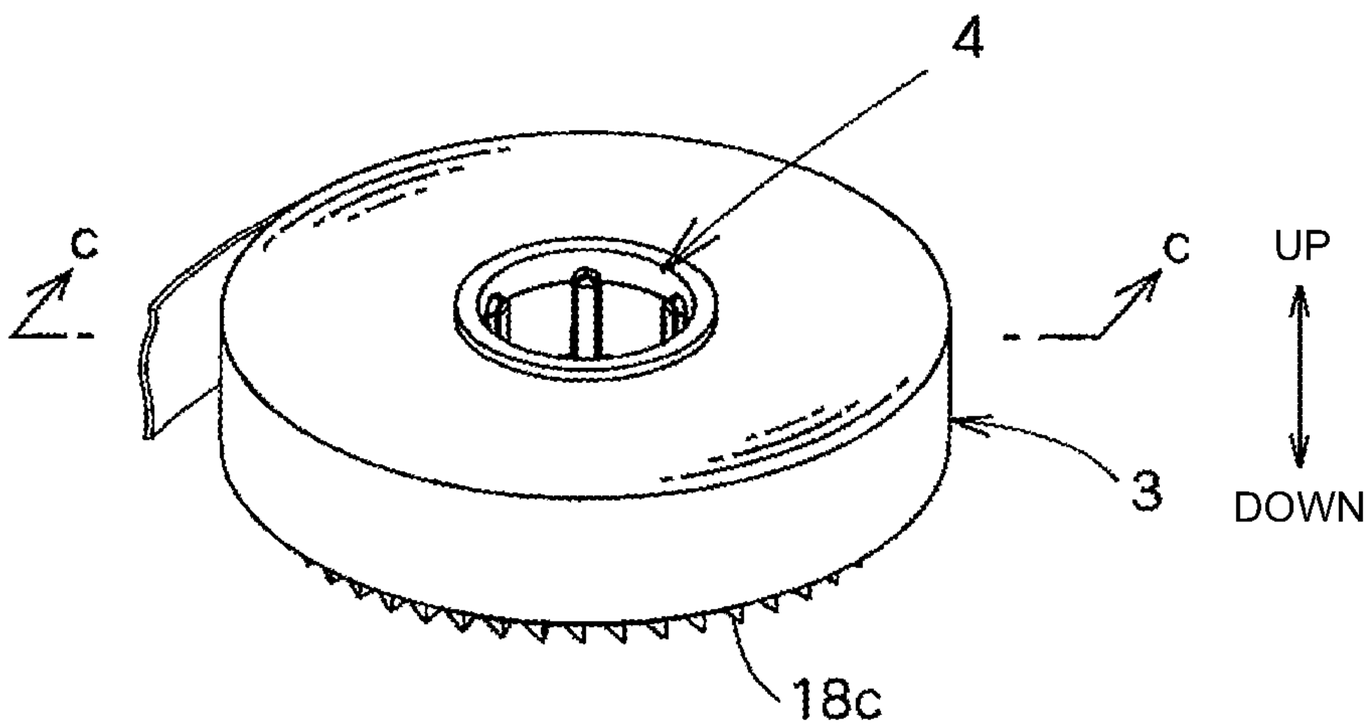

Fig. 7

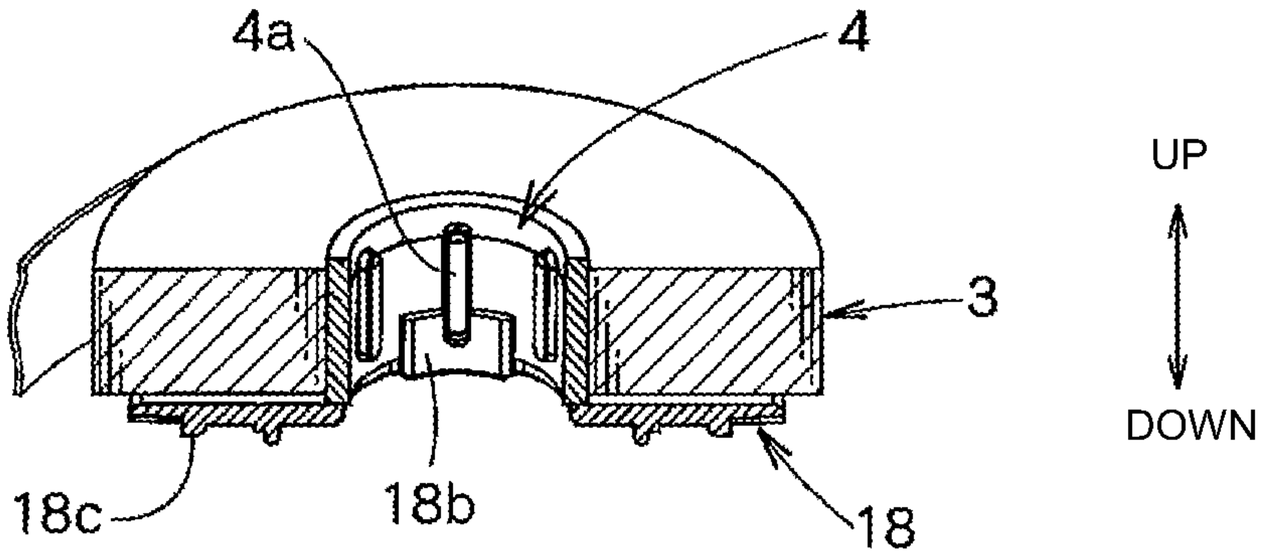

Fig. 8

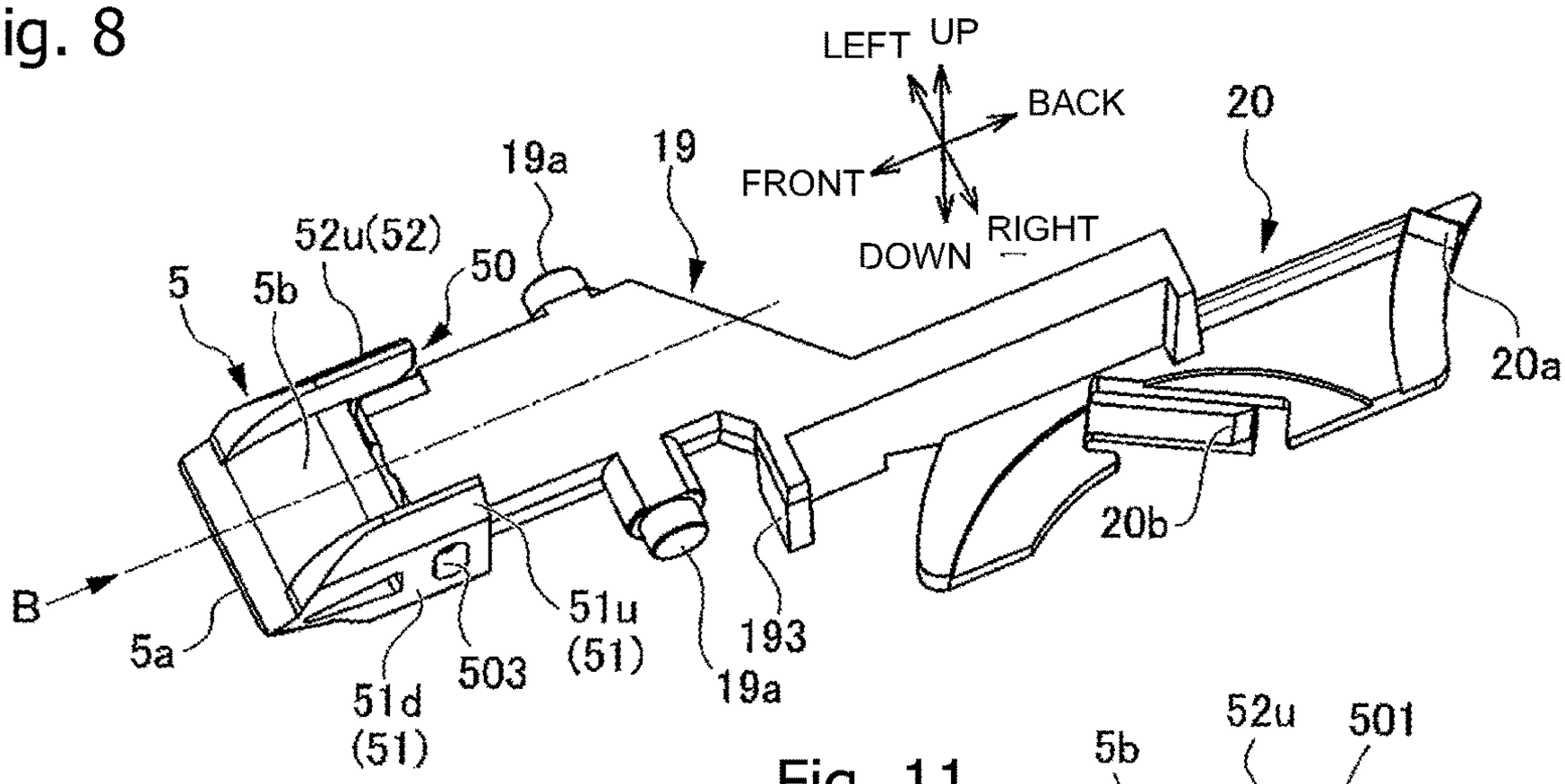

Fig. 9

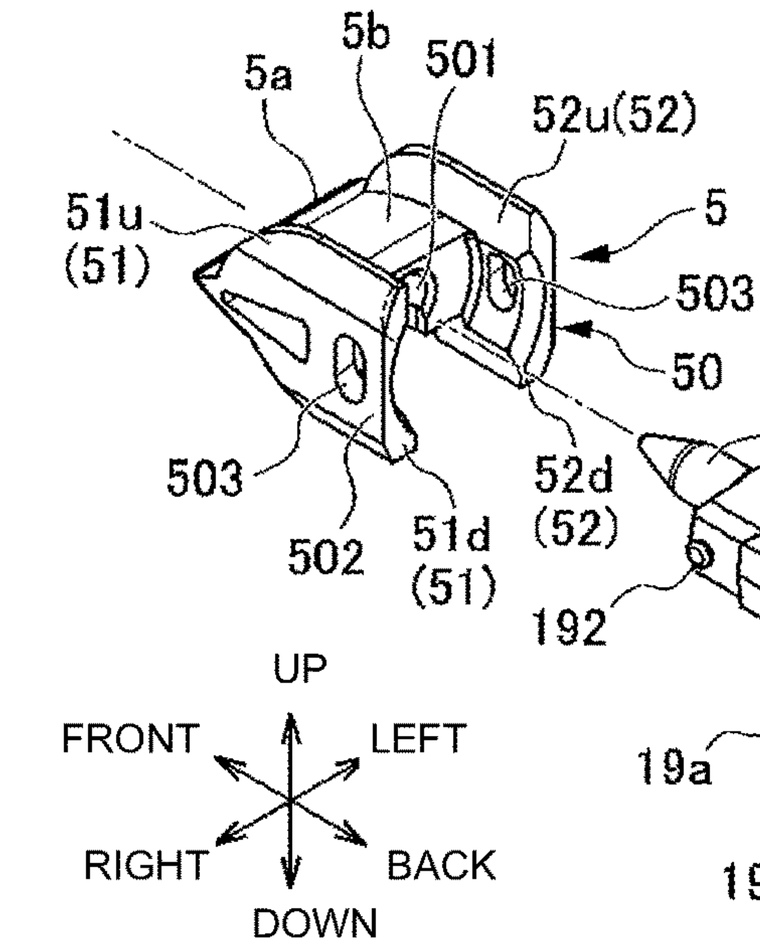

Fig. 10

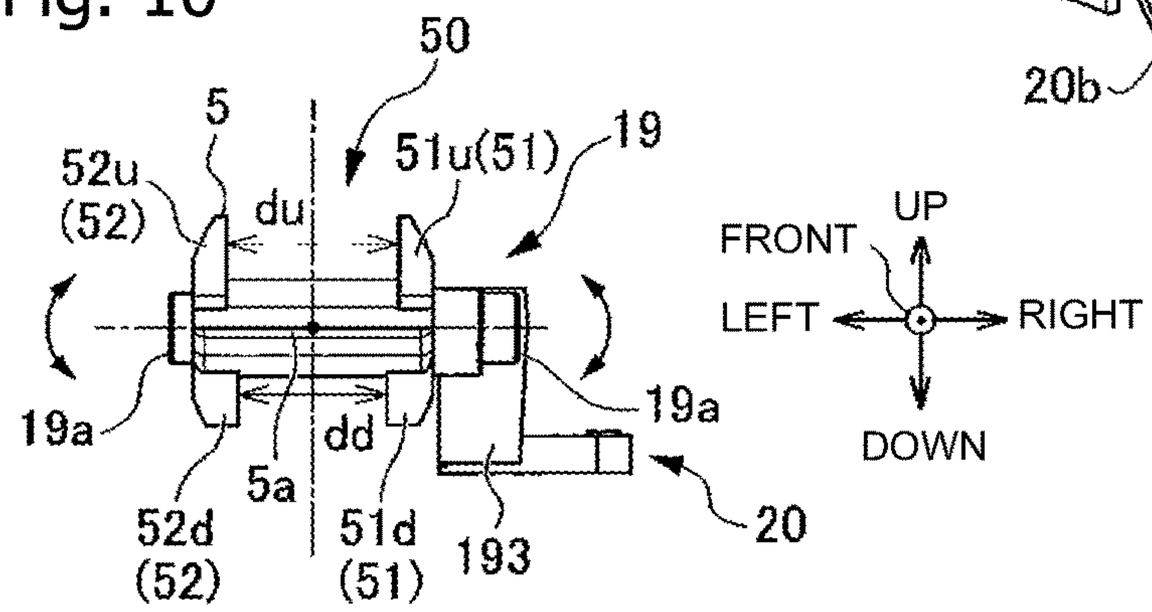

Fig. 11

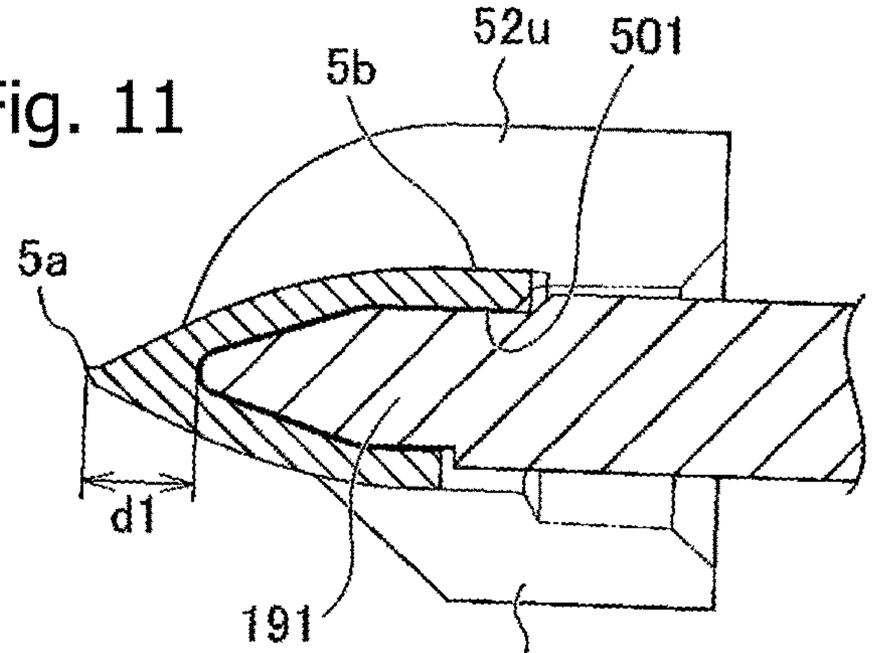

Fig. 12

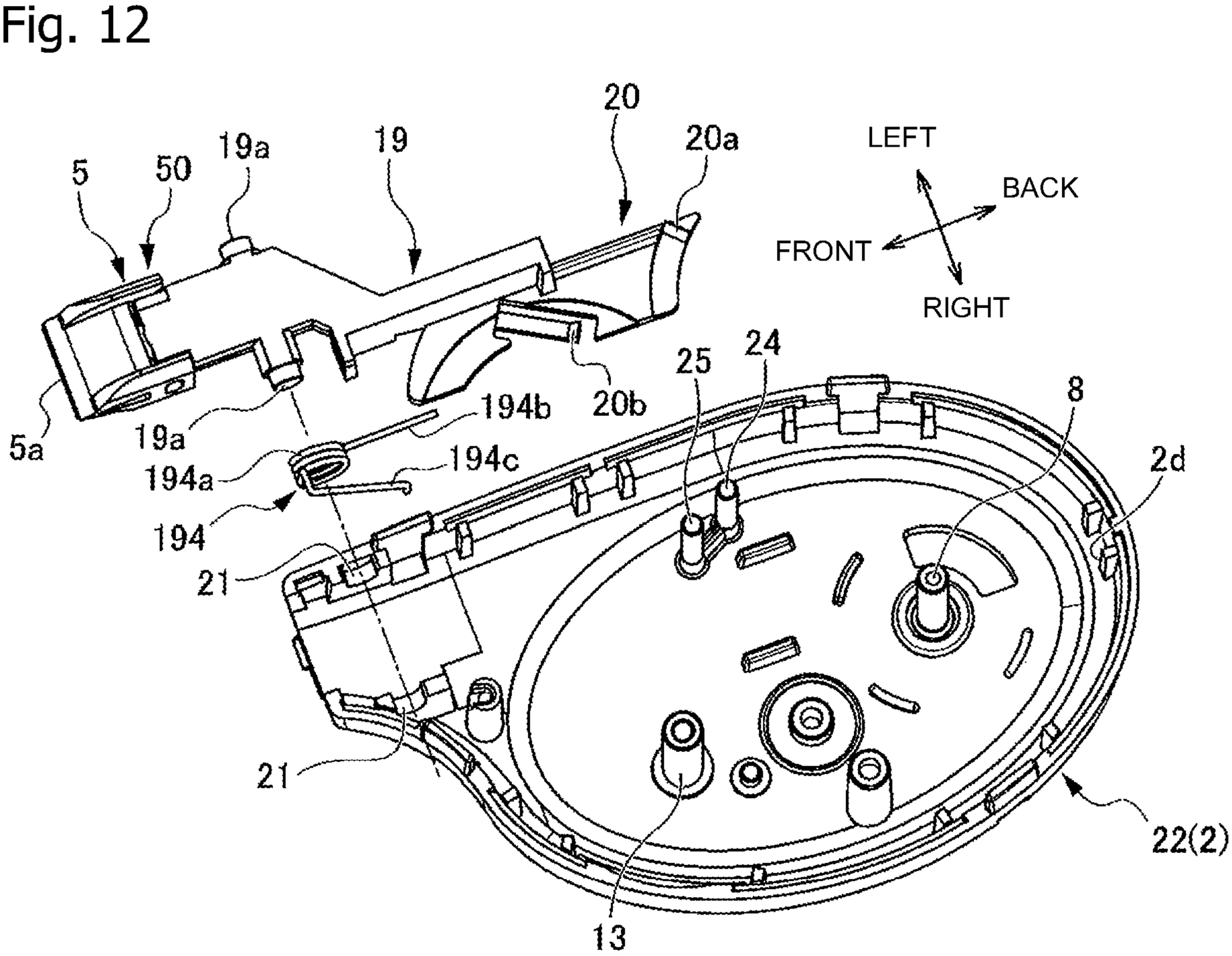
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Fig. 13

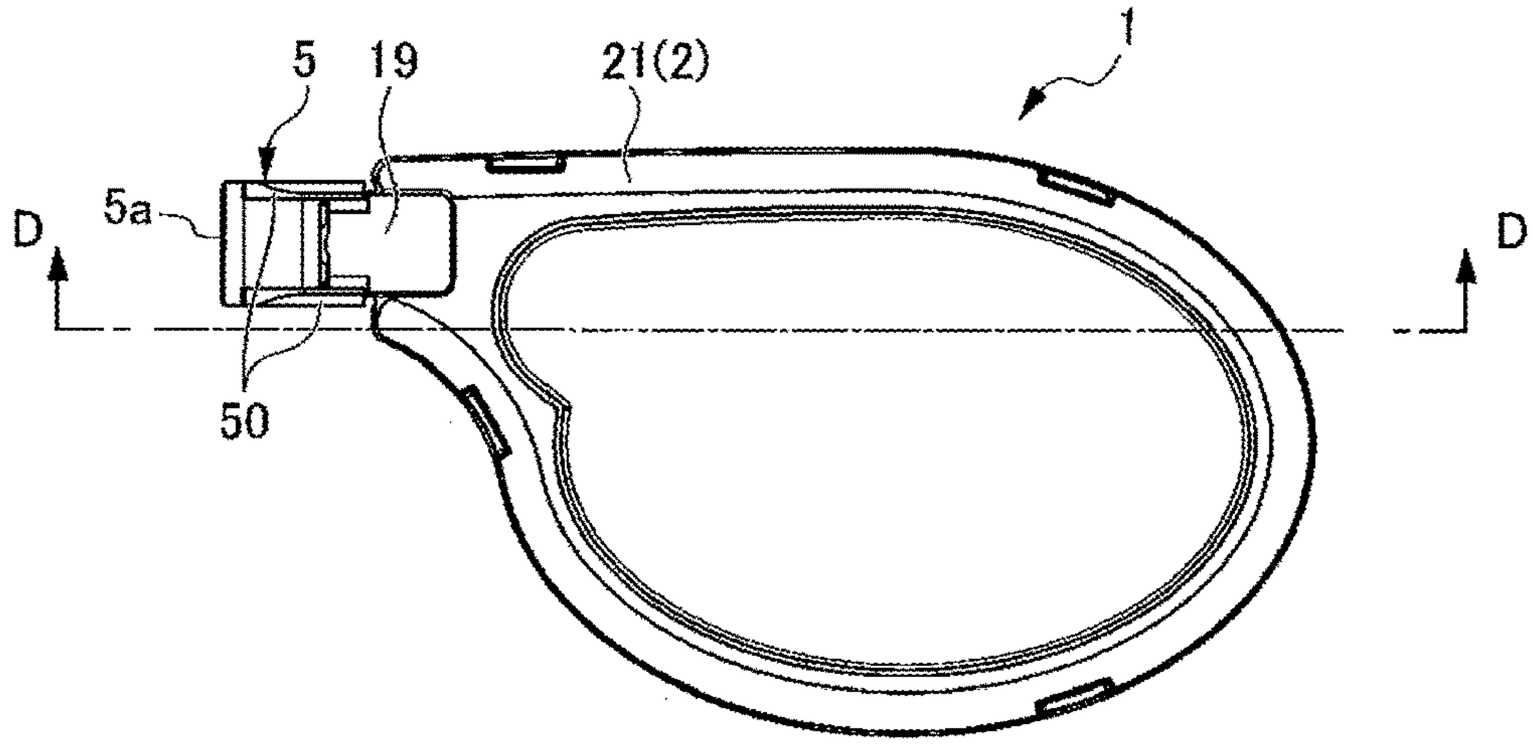


Fig. 14

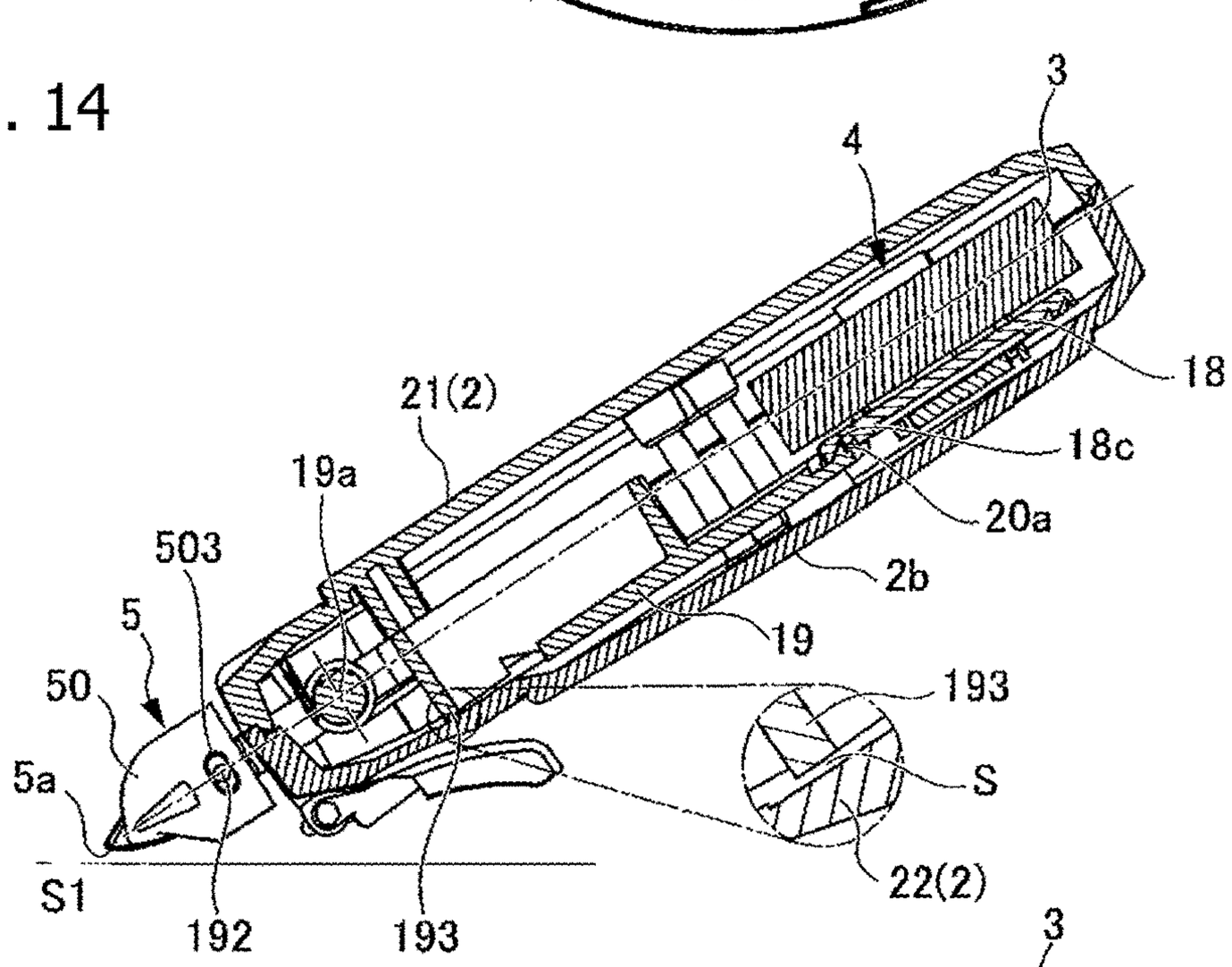


Fig. 15

Fig. 16

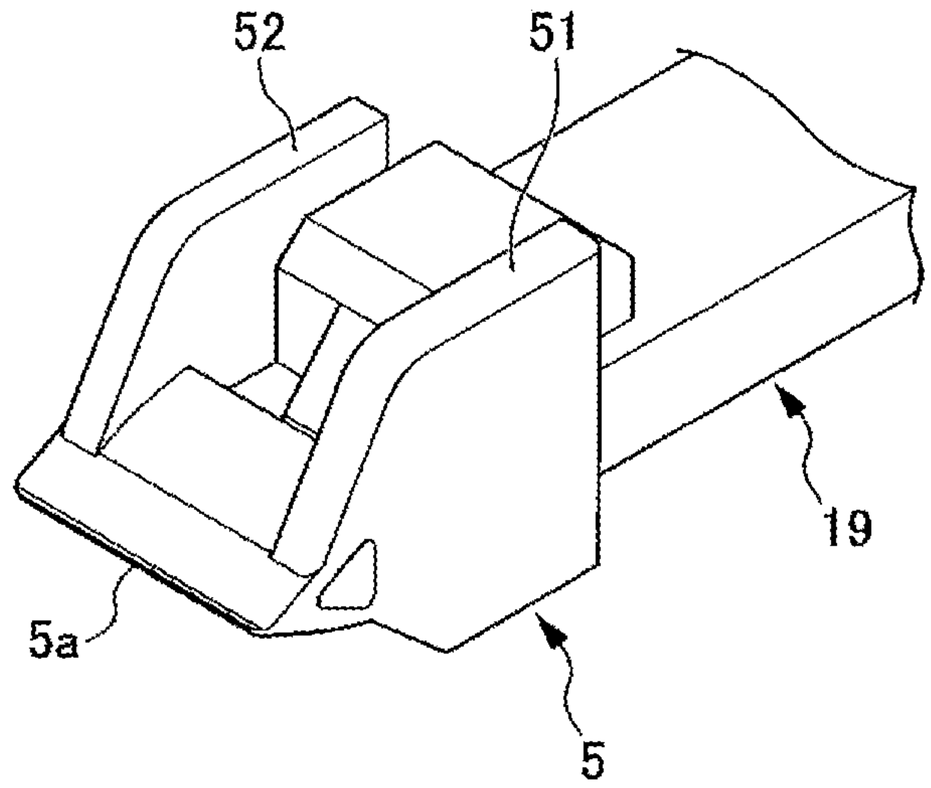
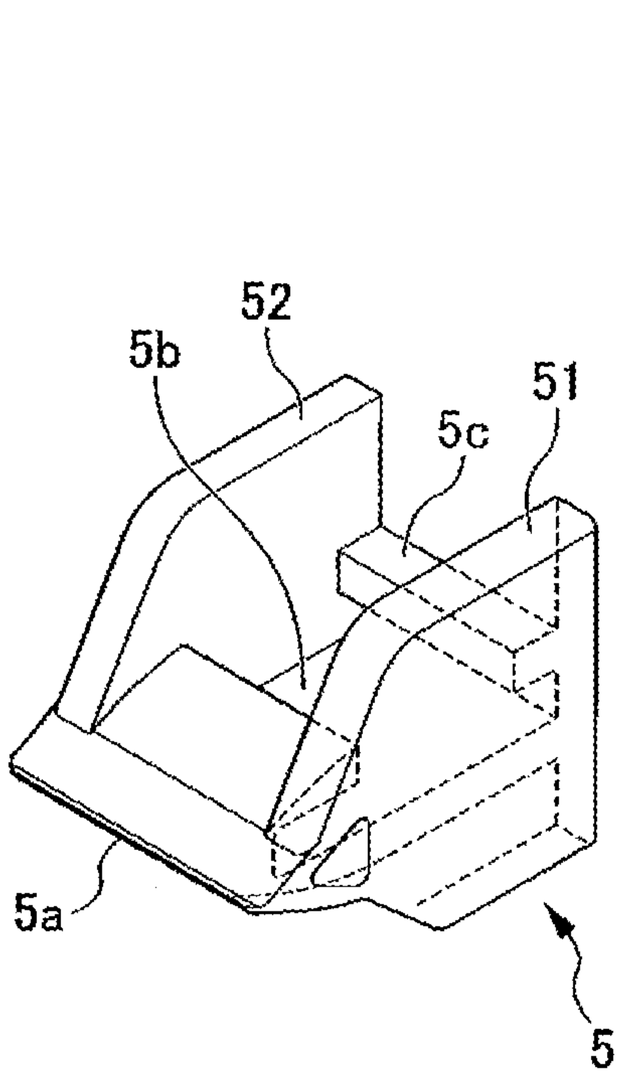
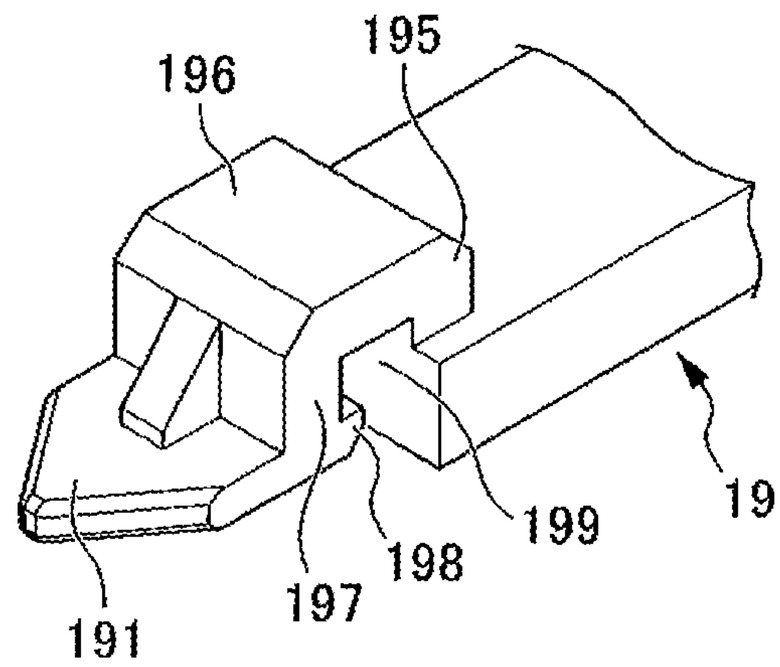


Fig. 17





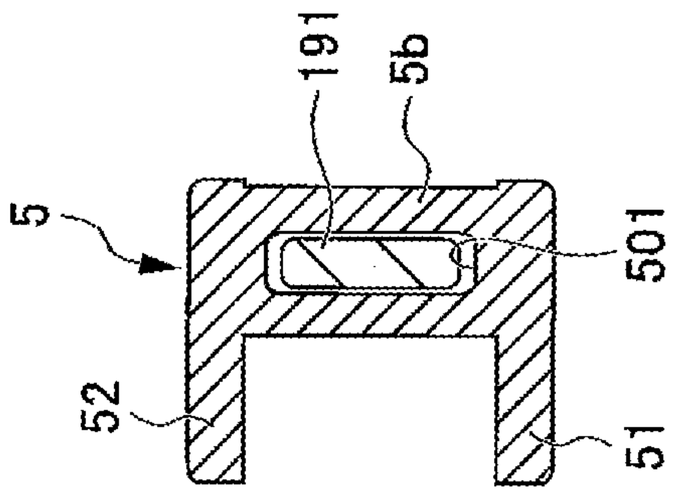


Fig. 20

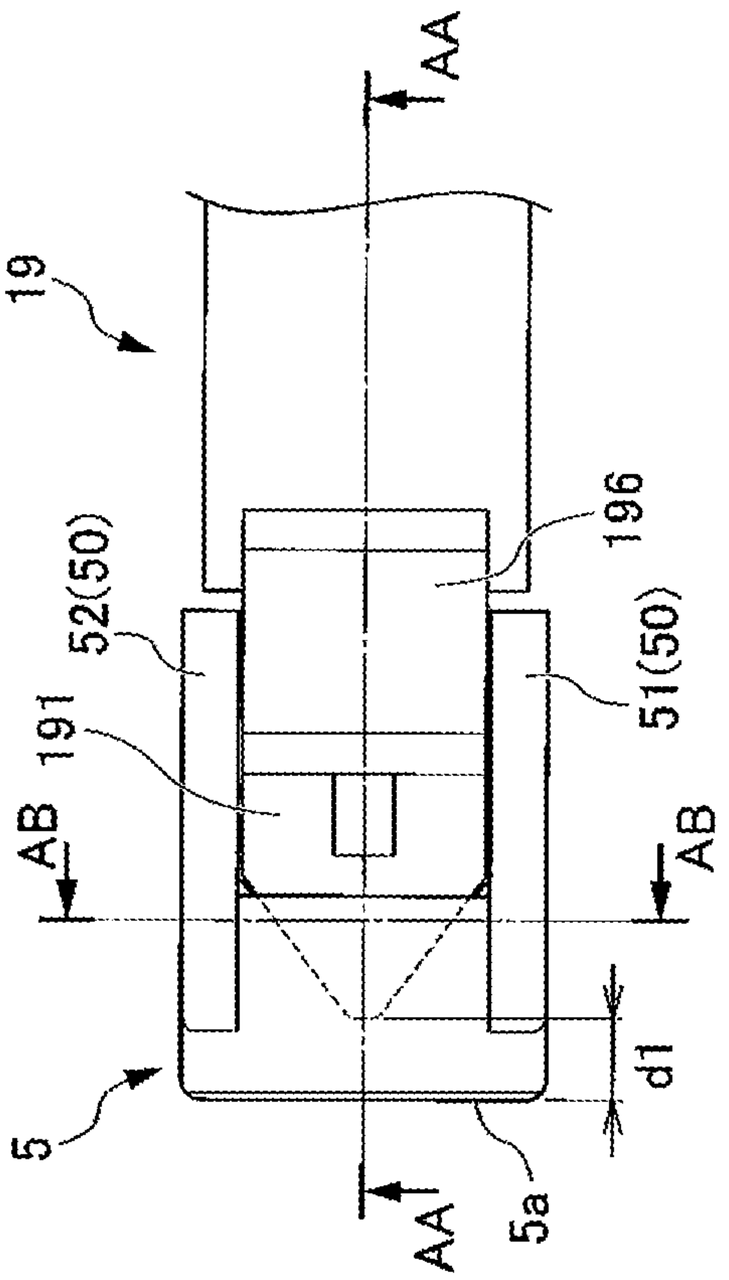


Fig. 18

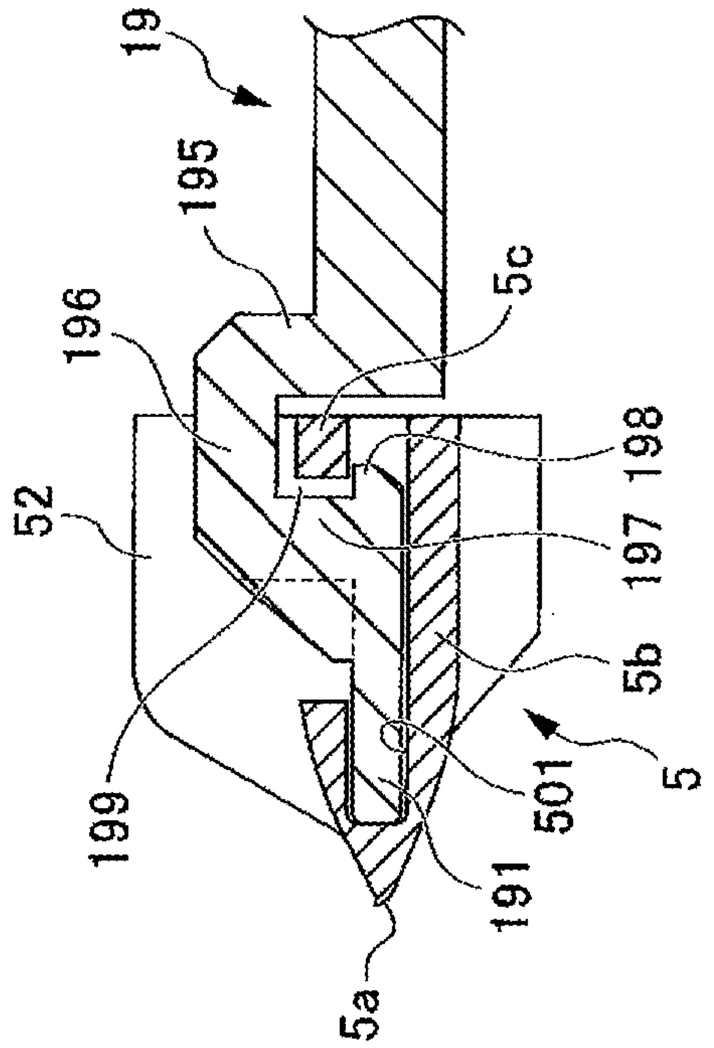


Fig. 19

COATING FILM TRANSFER TOOL

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority to Japanese Patent Application No. 2017-131409, filed Jul. 4, 2017, which is hereby incorporated by reference.

BACKGROUND

In general, a casing of a coating film transfer tool houses a feeding reel around which a transferable tape for holding a coating film on one surface is wound and a winding reel that winds the transferable tape after transferring the coating film. The transferable tape is extracted from the feeding reel, and the coating film is transferred to a transfer target surface of a transfer head protruding from the casing. Then, the transferable tape is wound around the winding reel.

Here, in order to appropriately transfer the coating film to the transfer target surface, a pressing edge portion provided in a front end of the transfer head for pressing the transferable tape has to press the transfer target surface with a uniform force.

However, if the pressing force becomes ununiform across a left-right direction (width direction) of the pressing edge portion of the transfer head in an actual transfer work, the coating film may not be transferred to the center of the coating film (so called "center dropout"). In addition, the ununiform pressing force may generate an insufficient adhering portion on the transfer target surface of the coating film so that cracking may occur in the transferred coating film, or chipping of the coating film may occur during writing disadvantageously.

That is, when the pressing force becomes ununiform across the left-right direction of the transfer head, the pressing force tends to be lower at the center than at both side portions in the width direction. In addition, out of the pressing edge portion of the transfer head, stiffness tends to increase in both side portions in which tape guides that guide the transferable tape are arranged. For this reason, a so-called center dropout problem occurs.

Therefore, in the related art, the pressing edge portion strongly abuts onto the transfer target surface by elastically deforming the pressing edge portion while pressing the transfer head to the transfer target with a strong force in order to uniformize the pressing force.

A transfer head has been developed, in which a pressing edge piece to the transferable tape is provided in a leading end of an elastically deformable main body piece by installing a base portion in the casing, a counterpart guide piece is continuously connected to the rear end of the pressing edge piece by interposing the transferable tape, and a slit of the rear end opening is provided between the guide piece and the main body piece.

However, in order to provide an elastically deformable main body piece, it is necessary to thin the main body piece, which reduces the strength. In addition, it is necessary to further provide a transfer load for elastic deformation as well as a force for pressing the pressing edge piece to the transfer target object. This generates a problem in convenience.

Meanwhile, a coating film transfer tool has been developed, in which the transfer head is pivotable about the casing or the like, so that the coating film can be transferred with a weaker force. If the transfer head is pivotable, the transfer head can be pivoted just by pressing the transfer head to the transfer target surface with a slight force, so that the pressing edge portion is arranged in parallel with the transfer target surface.

However, in the coating film transfer tool in which the coating film can be transferred with a weak force, it is not necessary to press the transfer head to the transfer target with a strong force. Therefore, a state in which the coating film is not transferred is easily generated in the center.

SUMMARY

One or more embodiments of the present invention relates to a coating film transfer tool for transferring a corrective or adhesive transferable tape.

In one or more embodiments, an object of the present invention is to provide a convenient coating film transfer tool by preventing a state in which the coating film is not transferred in the center of the coating film in the pressing edge portion of the transfer head.

In order to address the aforementioned problems, one or more embodiments of the present invention may provide one or more of the following features of a coating film transfer tool.

In one or more embodiments of the present invention, a coating film transfer tool may include: a casing that houses a feeding reel around which a transferable tape before transferring a coating film is wound and a winding reel that winds the transferable tape after transferring the coating film; and a transfer head having a main body portion arranged in a front side which is one side of a front-rear direction of the casing to extend in a left-right direction perpendicular to the front-rear direction in a front end portion and provided with a pressing edge portion for transferring the coating film to a transfer target surface, in which the casing or a base member housed in the casing has a protruding tip that extends to the transfer head side and is connected to the transfer head, and the protruding tip presses a part of an area including a center of the left-right direction of the main body portion to the transfer target surface side in the event of a transfer.

In one or more embodiments of the present invention, in the coating film transfer tool described above, a hole portion may extend from a rear side to a front side of the longitudinal direction and be provided in a part of the area including the center of the left-right direction of the main body portion, and the protruding tip be inserted into the hole portion.

In one or more embodiments of the present invention, the transfer head may be pivotable about the protruding tip.

In one or more embodiments of the present invention, a front end of the protruding tip may extend to at least the vicinity of the pressing edge portion.

In one or more embodiments of the present invention, a distance between the front end of the pressing edge portion of the transfer head and the front end of the protruding tip may be set to 0.3 mm to 8 mm, and may sometimes be set to 0.5 mm to 4 mm.

In one or more embodiments of the present invention, an extending direction of the pressing edge portion may be perpendicular to rotation shafts of the feeding reel and the winding reel.

In one or more embodiments of the present invention, the transfer head may have a pair of tape guides arranged in left and right sides of the main body portion, each of the pair of tape guides may have a lower tape guide arranged in a side where the transferable tape before transferring the coating film passes in the main body portion and an upper tape guide arranged in a side where the transferable tape after trans-

ferring the coating film passes in the main body portion, and a gap between the pair of the upper tape guides be wider than a narrowest gap between the pair of the lower tape guides.

According to one or more embodiments of the present invention, it may be possible to provide a convenient coating film transfer tool capable of preventing a state in which the coating film is not transferred in the center of the coating film in the pressing edge portion of the transfer edge.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a top perspective view illustrating a coating film transfer tool according to an embodiment of the invention.

FIG. **2** is a bottom perspective view illustrating the coating film transfer tool of FIG. **1**.

FIG. **3** is an exploded top perspective view illustrating the coating film transfer tool of FIGS. **1-2**.

FIG. **4** is an exploded bottom perspective view illustrating the coating film transfer tool of FIGS. **1-2**.

FIG. **5** is a top perspective view illustrating an embodiment of a state in which a flange is assembled with a feeding reel, illustrating a pre-assembly state.

FIG. **6** is a top perspective view of the embodiment of FIG. **5**, illustrating an assembled state.

FIG. **7** is a cross-sectional perspective view of the embodiment of FIG. **6**, taken along a line c-c of FIG. **6**.

FIG. **8** is a perspective view illustrating an embodiment where a base member has a transfer head installed in a front end and a rotation restricting member provided in a rear half portion.

FIG. **9** is an exploded perspective view of the embodiment of FIG. **8**.

FIG. **10** is an arrow view of the embodiment of FIG. **8**, as seen from an arrow B of FIG. **8**.

FIG. **11** is a cross-sectional view of the embodiment of FIG. **8**.

FIG. **12** is an exploded perspective view illustrating an embodiment where a base member is installed with a transfer head, a helical torsion spring, and a lower casing member.

FIG. **13** is a plan view illustrating a horizontal pulling type coating film transfer tool.

FIG. **14** is a cross-sectional view of the coating film transfer tool of FIG. **13**, taken along a line D-D of FIG. **13** to illustrate a state of a base body in a non-use state.

FIG. **15** is a cross-sectional view of the coating film transfer tool of FIG. **13**, taken along the line D-D of FIG. **13** to illustrate a state of a base body in a use state.

FIG. **16** is a perspective view of another embodiment, illustrating a transfer head and a part of the base member including a protruding tip.

FIG. **17** is an exploded perspective view of the embodiment of FIG. **16**, illustrating the transfer head and a part of the base member including the protruding tip.

FIG. **18** is a top view of the another embodiment, illustrating the transfer head and a part of the base member including the protruding tip.

FIG. **19** is a cross-sectional view taken along a line AA-AA of FIG. **18**.

FIG. **20** is a cross-sectional view taken along a line AB-AB of FIG. **18**.

DETAILED DESCRIPTION

One or more embodiments of the invention will now be described. FIGS. **1-2** are perspective views illustrating a coating film transfer tool **1** according to an embodiment of the invention FIG. **1** is a top perspective view, and FIG. **2** is a bottom perspective view.

FIG. **3** is an exploded top perspective view illustrating the coating film transfer tool **1** of FIGS. **1-2**.

FIG. **4** is an exploded bottom perspective view illustrating the coating film transfer tool **1** of FIGS. **1-2**. Note that a transferable tape **3** pressed to a transfer target surface in a transfer head **5** is not illustrated intentionally in several drawings.

Herein, a direction of transferring a coating film in a longitudinal direction of a casing **2** of the coating film transfer tool **1** will be referred to as a "front" direction, and its reverse direction will be referred to as a "rear" direction. In addition, a direction perpendicular to the longitudinal direction (front-rear direction) and a side where the transferable tape **3** before transferring the coating film passes in the transfer head **5** described below will be referred to as a "lower" side, and a side where the transferable tape **3** after transferring the coating film passes will be referred to as an "upper" side. Furthermore, a direction perpendicular to the front-rear direction and the up-down direction will be referred to as a left-right direction.

The coating film transfer tool **1** according to this embodiment is a so-called horizontal pulling type. The coating film transfer tool **1** has the casing **2** including a pair of casing members including upper and lower casing members **21** and **22**.

The casing **2** houses (between the upper casing member **21** and the lower casing member **22**) a feeding reel **4** around which the transferable tape **3** is wound, a base member **19** installed with the transfer head **5** that transfers the transferable tape **3** extracted from the feeding reel **4** to a transfer target surface, a winding reel **6** that winds the transferable tape **3** subjected to the transfer, and a power transmission mechanism **17** operated to synchronize the feeding reel **4** and the winding reel **6**.

As illustrated in FIG. **3**, inside of the lower casing member **22**, a feeding reel support shaft **8**, a winding reel support shaft **13**, a first guide pin **24** that guides the transferable tape **3** extracted from the feeding reel **4** to the transfer head **5**, and a second guide pin **25** that guides the transferable tape **3** subjected to transfer from the transfer head **5** to the winding reel **6** are erected to extend toward the upper casing member **21**.

Meanwhile, as illustrated in FIG. **4**, a feeding reel support shaft receptacle **8***a* into which the feeding reel support shaft **8** is inwardly inserted, a winding reel support shaft receptacle **13***a* into which the winding reel support shaft **13** is outwardly inserted, a first guide pin receptacle **24***a* into which the first guide pin **24** is inwardly inserted, and a second guide pin receptacle **25***a* into which the second guide pin **25** is inwardly inserted are provided on the inner surface of the upper casing member **21**.

Along the side portion of the upper casing member **21**, a plurality of fitting assist pieces **2***c* are erected to extend toward the lower casing member **22**. Along the side portion of the lower casing member **22**, a plurality of fitting assist seat portions **2***d* where the plurality of fitting assist pieces **2***c* are fitted are provided.

As the fitting assist pieces **2***c* of the upper casing member **21** are fitted to the fitting assist seat portions **2***d* of the lower casing member **22**, a pair of upper and lower casing members **21** and **22** are assembled with each other to form the casing **2**.

The feeding reel support shaft **8** provided in the lower casing member **22** is inwardly inserted into the feeding reel

support shaft receptacle **8***a* while a feeding reel gear **7** and the feeding reel **4** are outwardly inserted rotatably.

The feeding reel gear **7** has a tubular rotation shaft **7***b* provided with a locking portion **7***a* in its end. A compression spring **9**, an annular first spacer **10**, an annular elastic stopper **11**, and an annular second spacer **12** are sequentially inserted into the rotation shaft **7***b* and are retained by the locking portion **7***a*.

A locking protrusion **11***a* is provided on an outer circumferential surface of the elastic stopper **11**. Meanwhile, a rib-shaped locking target portion **4***a* where the locking protrusion **11***a* is locked is provided on the inner circumferential surface of the feeding reel **4**. As the locking protrusion **11***a* is locked to the rib-shaped locking target portion **4***a*, the elastic stopper **11** and the feeding reel **4** are rotated in synchronization.

An outer circumferential surface of the upper half of the rotation shaft **7***b* of the feeding reel gear **7** is cut out at nearly equal intervals to form four plane portions **7***c*. Meanwhile, the corner portions of inner holes **10***a* and **12***a* of the first and second spacers **10** and **12** are formed in an arc-like quadrilateral shape as seen in a plan view.

The plane portion **7***c* of the rotation shaft **7***b* adjoins with the sides of the quadrangles of the inner holes **10***a* and **12***a* of the first and second spacers **10** and **12**, so that the first and second spacers **10** and **12** are irrotationally fitted to the rotation shaft **7***b* of the feeding reel gear **7**. As a result, the feeding reel gear **7**, the compression spring **9**, the first spacer **10**, and the second spacer **12** are rotated in synchronization.

The winding reel **6** is outwardly inserted into the winding reel support shaft **13** erected on the inner surface of the lower casing member **22**. As illustrated in FIG. **4**, a winding reel gear **14** is provided on the lower side surface of the winding reel **6**. A first smaller gear **15** and a second smaller gear **16** are provided between the feeding reel gear **7** and the winding reel gear **14**.

The feeding reel gear **7** meshes with the first smaller gear **15**. The first smaller gear **15** meshes with the second smaller gear **16**. The second smaller gear **16** meshes with the winding reel gear **14**.

As the transferable tape **3** wound around the feeding reel **4** is extracted by performing a transfer work of the coating film, the rotation force of the feeding reel **4** is transmitted to the elastic stopper **11**, and is transmitted to the feeding reel gear **7** by virtue of frictional forces generated between the side surface of the elastic stopper **11** and the side surface of the second spacer **12**, between the side surface of the elastic stopper **11** and the side surface of the first spacer **10**, and between the side surface of a flange **18** rotating in synchronization with the feeding reel **4** as described below and the side surface of the feeding reel gear **7**.

As the feeding reel gear **7** is rotated, the rotation force is transmitted to the winding reel **6** through the power transmission mechanism **17** including the feeding reel gear **7**, the first smaller gear **15**, the second smaller gear **16**, and the winding reel gear **14**.

The flange **18** for controlling rotation of the feeding reel **4** during a non-use state and a use state of the coating film transfer tool **1** is integrally provided in the feeding reel **4**. A locking target teeth **18***c* described below are provided in the peripheral edge of the flange **18** (refer to FIG. **4**).

FIGS. **5-7** illustrate a state in which the flange **18** is assembled with the feeding reel **4**. FIG. **5** is a top perspective view illustrating a pre-assembly state, FIG. **6** is a top perspective view illustrating an assembled state, and FIG. **7** is a cross-sectional perspective view taken along a line c-c of FIG. **6**. Installation pieces **18***b* having notches **18***a* are provided on the upper surface of the flange **18**. As the rib-like locking target portion **4***a* of the feeding reel **4** is locked to the notches **18***a* of the installation pieces **18***b*, the feeding reel **4** and the flange **18** are assembled so as to rotate in synchronization.

Returning to FIG. **4** from FIGS. **1-2**, the coating film transfer tool **1** has the base member **19** and the transfer head **5** formed separately from the base member **19**.

FIGS. **8-11** illustrate the base member **19** having the transfer head **5** installed in a front end and a rotation restricting member **20** provided in a rear half portion. FIG. **8** is a perspective view, FIG. **9** is an exploded perspective view, FIG. **10** is an arrow view as seen from an arrow B of FIG. **8**, and FIG. **11** is a cross-sectional view.

As illustrated in FIG. **9**, a protruding tip **191** protruding to the front side is provided in the leading end of the base member **19**. In addition, a pair of protrusions **192** protruding perpendicularly to the extending direction of the protruding tip **191** (in the left-right direction) are formed on each of the side surfaces of the leading end of the base member **19**.

As illustrated in FIG. **11**, the transfer head **5** has a main body portion **5***b* having a pressing edge portion **5***a* formed in an approximately triangular shape on a cross section taken along the longitudinal direction and provided in the front end. The pressing edge portion **5***a* extends in the left-right direction perpendicular to the longitudinal direction in a portion where the coating film is transferred to the transfer target object.

A hole portion **501** extending to the front side from the rear side of the longitudinal direction is provided in the center of the left-right direction on the rear end surface of the main body portion **5***b*. The protruding tip **191** is inserted into the hole portion **501**. As a result, the transfer head **5** and the base member **19** are connected to each other.

The front end of the hole portion **501** is placed in the vicinity of the pressing edge portion **5***a*. As the protruding tip **191** is inserted into the hole portion **501**, the front end of the protruding tip **191** is inserted at least to the vicinity of the pressing edge portion **5***a*. Specifically, a distance dl between the front end of the pressing edge portion **5***a* of the transfer head **5** and the front end of the protruding tip **191** when the protruding tip **191** is inserted into the hole portion **501** may be set to 0.3 mm to 8 mm, and may be set to 0.5 mm to 4 mm. By arranging the front end of the protruding tip **191** in this manner, it is possible to reliably transmit the pressing force to the pressing edge portion **5***a* when the transfer head **5** is pressed by the protruding tip **191**.

When the coating film is transferred to a transfer target surface S**1** (illustrated in FIGS. **13-15** as described below), an oblique downward force is applied to the casing **2** such that the lower surface of the pressing edge portion **5***a* of the transfer head **5** (the side where the transferable tape **3** passes before transferring the coating film) is pressed to the transfer target surface S**1**. Then, the protruding tip **191** presses the lower surface of the hole portion **501** downward, so that a predetermined range of the area including the center of the left-right direction of the main body portion **5***b* (a part of the area instead of the entire area of the left-right direction) is pressed.

In this case, the main body portion **5***b* is pivotable about the protruding tip **191**. Therefore, the pressing edge portion **5***a* becomes in parallel with the transfer target surface S**1**. In this state, while nipping the transferable tape **3** therebetween, the pressing edge portion **5***a* is pressed to the transfer target surface S**1** and moves on the contact target surface S**1**. Then, the coating film held by the transferable tape **3** is transferred to the transfer target surface S**1**.

Note that the main body portion **5***b* including the pressing edge portion **5***a* in the transfer head **5** may be formed of a material having slight elasticity. If the pressing edge portion **5***a* has slight elasticity, adherence between the pressing edge portion **5***a* and the transfer target surface S**1** is improved so as to provide an excellent transfer feeling.

The transfer head **5** has a pair of tape guides **50** extending from the left and right side portions of the main body portion **5***b* to the rear side over the rear end surface of the main body portion **5***b*.

Long holes **503** extending in the vertical direction (perpendicularly to the transfer surface of the transfer head **5**) are formed in a pair of tape guides **50** backward of the main body portion **5***b*. The pair of tape guides **50** also cover the leading end side of the base member **19** while the protruding tip **191** of the base member **19** is inserted into the hole portion **501**.

The protrusions **192** of the base member **19** are inserted into the long holes **503**. As a result, the transfer head **5** is connected to the base member **19**.

Here, the vertical length of the long hole **503** is set to be longer than the diameter of the protrusion **192**. As a result, as illustrated in FIG. **10**, the transfer head **5** connected to the leading end of the base member **19** becomes pivotable about the protruding tip **191** inserted into the hole portion **501**. In addition, the transfer head **5** becomes pivotable within a range that the protrusion **192** can move inside the long hole **503**. That is, the vertical length of the long hole **503** determines a pivotable range of the transfer head **5**. In other words, the long hole **503** restricts the pivotable range of the transfer head **5**.

By pivoting the transfer head **5**, the pressing edge portion **5***a* of the transfer head **5** can be easily arranged in parallel with the transfer target surface. Therefore, it is not necessary for a user to elastically deform the pressing edge portion **5***a* by strongly pressing the transfer head **5** in order to arrange the pressing edge portion **5***a* of the transfer head **5** in parallel with the transfer target surface. Therefore, it is possible to uniformly transfer the coating film with a small transfer load.

FIG. **12** is an exploded perspective view illustrating the base member **19** installed with the transfer head **5**, a helical torsion spring **194**, and the lower casing member **22**.

The base member **19** is biased such that the rotation restricting member **20** inhibits rotation of the feeding reel **4** with the helical torsion spring **194**.

The helical torsion spring **194** has a coil portion **194***a*, a first spring portion **194***b* extending from one end of the coil portion **194***a*, and a second spring portion **194***c* extending from the other end of the coil portion **194***a*. In addition, the helical torsion spring **194** biases the base member **19** so as to inhibit rotation of the feeding reel **4** by outwardly fitting the coil portion **194***a* to a support shaft **19***a* of the base member **19**, fixing the first spring portion **194***b* to the lower surface side of the base member **19**, and fixing the second spring portion **194***c* to the inner surface of the underlying lower casing member **22**.

A winding reel locking hook **20***b* is formed integrally with the base member **19** in an arm shape and has elasticity.

FIGS. **13-15** illustrate a state of a base body in a use state and in a non-use state. FIG. **13** is a plan view illustrating the coating film transfer tool, FIG. **14** is a cross-sectional view taken along a line D-D of FIG. **13** to illustrate a non-use state, and FIG. **15** is a cross-sectional view taken along a line D-D of FIG. **13** to illustrate a use state.

The coating film transfer tool **1** has a restricting portion **193** that restricts the base member **19** from further pivoting from a position in which inhibition of rotation of the feeding reel **4** using the rotation restricting member **20** is released while the transfer head **5** is pressed to the transfer target surface S**1** during a use state.

As illustrated in FIGS. **14** and **15**, the restricting portion **193** is formed integrally with the base member **19** and is arranged to protrude downward from the lower surface of the base member **19**. More specifically, the restricting portion **193** is arranged in the vicinity of the support shaft **19***a* of the base member **19** backward of the support shaft **19***a*.

Using the coating film transfer tool **1** having the aforementioned restricting portion **193**, the base member **19** is biased such that the rear end side is raised upward higher than the support shaft **19***a* by the helical torsion spring **194** during a non-use state as illustrated in FIG. **14**, and a feeding reel locking hook **20***a* of the rotation restricting member **20** is engaged with the locking target teeth **18***c* of the flange **18** rotating in synchronization with the feeding reel **4**.

As a result, rotation of the feeding reel **4** is inhibited. In addition, in this state, a predetermined gap S is formed between the restricting portion **193** and the inner surface of the underlying lower casing member **22**.

Meanwhile, during a use state (transfer) of the coating film transfer tool **1**, the transfer head **5** is pressed to the transfer target surface S**1** as illustrated in FIG. **15**. Therefore, the base member **19** is pivoted about the support shaft **19***a* such that the transfer head **5** moves upward resisting to the biasing force of the helical torsion spring **194**. Then, the rotation restricting member **20** arranged oppositely to the transfer head **5** with respect to the support shaft **19***a* moves downward, so that the feeding reel locking hook **20***a* engaged with the locking target teeth **18***c* during a non-use state is disengaged from the locking target teeth **18***c*, and rotation inhibition of the feeding reel **4** is released.

While the base member **19** pivots to a position in which inhibition of rotation of the feeding reel **4** by the rotation restricting member **20** is released, the restricting portion **193** comes into contact with the inner surface of the lower casing member **22**, so that further pivoting of the base member **19** is restricted.

Note that the winding reel locking hook **20***b* is formed in an arm shape and has elasticity as described above. As a result, even when locking between the feeding reel locking hook **20***a* and the locking target teeth **18***c* of the flange **18** of the feeding reel **4** is not released in order to prevent loosening during a non-use state, the winding reel locking hook **20***b* is elastically deformed so that the winding reel **6** can be rotated in a winding direction.

Returning to FIGS. **8-11**, as described above, the transfer head **5** has the pair of tape guides **50** in the left and right sides of the main body portion **5***b*. The pair of tape guides **50** include a right tape guide **51** and a left tape guide **52** arranged in parallel with each other.

The right and left tape guides **51** and **52** have upper tape guides **51***u* and **52***u*, respectively, positioned in an upper part of the main body portion **5***b* and lower tape guides **51***d* and **52***d*, respectively, positioned in a lower part of the main body portion **5***b*.

As illustrated in FIG. **10**, a gap dd between the pair of lower tape guides **51***d* and **52***d* provided in the left and right sides is set to, for example, −0.03 mm to +0.3 mm with respect to the width of the transferable tape **3**.

As illustrated in FIG. **11** and the like, the front ends of the lower tape guides **51***d* and **52***d* (only **52***d* is illustrated) are positioned in rear of the front ends of the upper tape guides

51*u* and **52***u* (only **52***u* is illustrated), and are separated from the leading end of the pressing edge portion **5***a* by a predetermined distance.

The front sides of the lower tape guides **51***d* and **52***d* are obliquely inclined so as to descend backward from the front end.

In this manner, the front ends of the lower tape guides **51***d* and **52***d* are separated from the pressing edge portion **5***a* by a predetermined distance, and the front sides of the lower tape guides **51***d* and **52***d* are obliquely formed. Therefore, the lower tape guides **51***d* and **52***d* do not hinder contact between the pressing edge portion **5***a* and the transfer target surface S**1** and a transfer of the transferable tape.

A gap du between the front ends of the pair of upper tape guides **51***u* and **52***u* provided in the left and right sides is wider than the gap dd between the lower tape guides **51***d* and **52***d*. For example, the gap du may be set to 0.5 mm or larger with respect to the width of the tape, and may be set to 1 mm or larger and 3 mm or smaller with respect to the width of the tape.

The front ends of the upper tape guides **51***u* and **52***u* are placed in the vicinity of the pressing edge portion **5***a* in front of the lower tape guides **51***d* and **52***d*. The front sides of the upper tape guides **51***u* and **52***u* have an arc shape curved rearward from the front end to the upper side, so that the upper tape guides **51***u* and **52***u* have a fan shape.

According to the present invention, the front ends of the upper tape guides **51***u* and **52***u* are placed slightly in rear of the front end of the pressing edge portion **5***a* (that is, not far from the pressing edge portion **5***a*).

Here, the front ends of the upper tape guides **51***u* and **52***u* are portions of the upper tape guides **51***u* and **52***u* placed frontmost in the tape path.

Note that the gap du between the front ends of the upper tape guides **51***u* and **52***u* is wider than the narrowest gap between the lower tape guides **51***d* and **52***d* in the tape path. In addition, the gap du between the front ends of the upper tape guides **51***u* and **52***u* may be wider than the widest gap between the lower tape guides **51***d* and **52***d* in the tape path.

The transferable tape **3** is manufactured, for example, by forming a release layer such as silicon resin on one or both surfaces of a long body formed of a plastic film such as polyethylene terephthalate, polypropylene, and polyethylene or paper with a thickness of 3 μm to 60 μm as a base material, and coating an adhesive or the like on one surface of the base material using a method known in the art.

The adhesive includes an acrylic resin-based adhesive, a vinyl resin-based adhesive, a rosin-based adhesive, a rubber-based adhesive, or a mixture obtained by mixing an agent such as a crosslinking agent, a tackifier, a plasticizer, an antioxidant, a filler, a thickener, a pH adjuster, and an antifoaming agent with such an adhesive as appropriate. Specifically, a tape having the adhesive layer provided on one surface of the base material is an adhesive tape (tape paste). A tape having an opaque layer formed of pigments having opacity and polymer resin as a binder or the like provided on one surface of the base material and an adhesive layer formed thereon is a corrective tape. A tape having a fluorescent coloring layer provided on one surface of the base material and an adhesive layer formed thereon is a fluorescent tape. The layer formed on one surface of the base material has a thickness of 0.3 μm to 60 μm, for example, after drying.

In general, the transferable tape **3** has a width of approximately 2 mm to 15 mm.

(1) According to this embodiment, the protruding tip **191** is formed in the leading end of the base member **19**, and the hole portion **501** extending from the rear side to the front side of the longitudinal direction is formed on the rear end surface of the transfer head **5** as described above. As the protruding tip **191** is inserted into the hole portion **501**, and a force is applied to the casing **2** in the event of a transfer such that the pressing edge portion **5***a* of the transfer head **5** presses the transfer target surface, the protruding tip **191** presses the inner surface of the hole portion **501** downward, so that a part of the area including the center of the left-right direction of the main body portion **5***b* is pressed.

Here, for example, as Comparative Example 1, if the entire area of the main body portion **5***b* is pressed instead of the partial area unlike this embodiment, the pressing force tends to be weakened in the center of the left-right direction of the pressing edge portion **5***a* relative to the left and right ends. This may easily generate a state in which the coating film is not transferred in the center of the coating film (so-called a center dropout).

However, according to this embodiment, the center of the pressing edge portion **5***a* is pressed, and the force is distributed from the center to the left and right directions. Therefore, a state in which the coating film is not transferred in the center of the coating film is not easily generated regardless of the transfer load. In addition, cracking of the transferred coating film or chipping of the coating film during writing does not easily occur.

(2) According to this embodiment, the transfer head **5** is pivotable about the protruding tip **191** inserted into the hole portion **501**.

By virtue of pivoting of the transfer head **5**, it is possible to easily arrange the pressing edge portion **5***a* of the transfer head **5** in parallel with the transfer target surface S**1**. Therefore, it is not necessary for a user to strongly press the transfer head **5** and elastically deform the pressing edge portion **5***a* in order to arrange the pressing edge portion **5***a* of the transfer head **5** in parallel with the transfer target surface S**1**. Accordingly, it is possible to uniformly transfer the coating film with a small transfer load.

(3) The main body portion **5***b* is pivotable about the protruding tip **191**. Therefore, the pressing edge portion **5***a* can abut on the transfer target surface without twisting or deforming the protruding tip **191**.

Therefore, it is not necessary to weaken the stiffness of the protruding tip **191** or thin the protruding tip **191**. Accordingly, it is possible to increase a strength of the protruding tip **191** as a connecting portion between the casing **2** and the transfer head **5** and improve durability of the coating film transfer tool **1**.

(4) Since the protruding tip **191** and the main body portion **5***b* are separate members, they can be manufactured using different materials. Therefore, it is possible to manufacture the main body portion **5***b* with a material having small elasticity unlike the protruding tip **191**.

Since the main body portion **5***b* is manufactured of a material having elasticity, compared to the protruding tip **191**, it is possible to further improve adherence between the main body portion **5***b* (pressing edge portion **5***a*) and the transfer target surface S**1**. Therefore, it is possible to improve a transfer feeling. Furthermore, it is possible to further prevent a state in which the coating film is not transferred in the center of the coating film.

(5) For example, as Comparative Example 2, a shaft of the main body portion may be lengthened to the rear side and may be connected to the casing or the base member. In this case, a structure for pivotally receiving the shaft is necessary in the casing or the base member. This accordingly increases the thickness of the casing.

However, the thinner casing is desirable in terms of storability. According to this embodiment, an axial support structure (the protruding tip **191** and the hole portion **501**) is in the transfer head **5** side. Therefore, the casing **2** is not thickened. Note that, since the transfer head **5** side has space, the entire size of the coating film transfer tool **1** does not increase even when the structure for receiving the protruding tip **191** such as the hole portion **501** is provided.

(6) For example, similar to Comparative Example 2, if the shaft is lengthened from the main body portion to the rear side and is connected to the casing or the base member, the rotating transfer head becomes heavy, and the transfer head is lengthened in the longitudinal direction as a whole, relative to this embodiment. As a result, compared to this embodiment, pivoting of the transfer head to follow the shape of the transfer target surface becomes difficult.

However, according to this embodiment, the transfer head **5** is compact. Therefore, pivoting to follow the transfer target surface becomes easy.

(7) According to this embodiment, when the transferable tape **3** is continuously fed and passes through a gap between the lower tape guides **51***d* and **52***d* during a use state of the coating film transfer tool **1**, a left-right deviation of the transferable tape **3** is restricted by the lower tape guides **51***d* and **52***d*.

Here, when the transfer head **5** is pivoted, the gap between the lower tape guides **51***d* and **52***d* is nearly equal to the width of the transferable tape **3**. Therefore, the lower tape guides **51***d* and **52***d* may come into contact with the transferable tape **3**, and the edge of the transferable tape **3** may be slightly twisted (flexed, deformed, or distorted).

However, even when the edge of the transferable tape **3** is slightly twisted, the transferable tape **3** is recovered to its original shape by virtue of a restoring force or a tensile force of the transferable tape **3** by further feeding the transferable tape **3** from the position coming into contact with the lower tape guides **51***d* and **52***d* to move forward.

(8) For example, if the transfer head **5** is pivoted and inclined when the transferable tape **3** passes through the pressing edge portion **5***a*, the upper tape guides **51***u* and **52***u* provided in the vicinity of the pressing edge portion **5***a* may come into contact with the edge of the transferable tape **3**, so that the transferable tape **3** may be twisted.

If the transferable tape **3** is twisted in the vicinity of the pressing edge portion **5***a* in this manner, the transferable tape **3** may be transferred while the edge of the transferable tape **3** is bent in the pressing operation.

Then, a portion that does not come into contact with the transfer target surface is generated in the coating film. This portion is not transferred to the transfer target surface and may reduce the width of the coating film or generate a partial damage to the coating film.

However, according to this embodiment, the gap between the upper tape guides **51***u* and **52***u* arranged in the vicinity of the pressing edge portion **5***a* is wider than the gap between the lower tape guides **51***d* and **52***d*. Therefore, even when the transfer head **5** is inclined, a possibility of contact with the upper tape guides **51***u* and **52***u* is low.

Therefore, a possibility of reducing the width of the coating film or generating a partial damage decreases when the transferable tape **3** is transferred to the transfer target surface.

According to this embodiment, as the pressing force of the transfer head **5** to the transfer target surface is released after the transfer, the transfer head **5** is returned to a specified position by virtue of a restoring force or a tensile force of the transferable tape **3** (to a position where the transfer head **5** is not rotated or a direction in which the pressing edge portion **5***a* becomes perpendicular to the feeding direction of the transferable tape **3**).

(9) In addition, the coating film transfer tool **1** according to the invention is the so-called horizontal pulling type coating film transfer tool **1** in which a direction of the pressing edge portion **5***a* placed in the front end of the transfer head **5** to press the transferable tape **3** to the transfer target surface is substantially perpendicular to the feeding reel support shaft **8** of the feeding reel **4** and the winding reel support shaft **13** of the winding reel **6**. As a result, it is possible to provide the convenient coating film transfer tool **1**.

FIGS. **16-17** illustrate another embodiment. FIG. **16** is a perspective view illustrating the transfer head **5** and a part of the base member **19** including the protruding tip **191**, and FIG. **17** is an exploded perspective view illustrating the transfer head **5** and a part of the base member **19** including the protruding tip **191**.

FIGS. **18-20** illustrate the another embodiment. FIG. **18** is a top view illustrating the transfer head **5** and a part of the base member **19** including the protruding tip **191**, FIG. **19** is a cross-sectional view taken along a line AA-AA of FIG. **18**, and FIG. **20** is a cross-sectional view taken along a line AB-AB of FIG. **18**.

The another embodiment is different from the first described embodiment in the structure of the connecting portion between the transfer head **5** and the base member **19**. Like reference numerals denote like elements as in the first described embodiment, and they will not be described.

The base member **19** includes a first portion **195** formed by bulging a predetermined area including the center of the left-right direction of the front end by a predetermined height in the front end portion, a second portion **196** that is bent from the upper end of the first portion **195** and extends forward, a third portion **197** that is bent from the second portion **196** and extends downward, and the protruding tip **191** extending forward from the lower end of the third portion **197**.

The protruding tip **191** is shaped to have an approximately uniform thickness in the vertical direction while a triangular horizontal cross-sectional portion is installed in a leading end of a rectangular horizontal cross-sectional portion.

A front end surface of the base member **19**, a front surface of the first portion **195**, a lower surface of the second portion **196**, a rear surface of the third portion **197**, and an upper surface of a fourth portion **198** that is placed in rear of the protruding tip **191** and protrudes slightly backward of the rear surface of the third portion **197** constitute an engagement portion **199** extending in the left-right direction in an approximately rectangular vertical cross-sectional shape. The engagement portion **199** is engaged with a crossbar portion **5***c* described below.

Meanwhile, the transfer head **5** includes the main body portion **5***b* and the pressing edge portion **5***a* that is provided in front of the main body portion **5***b* and has a rectangular parallelepiped horizontal cross section and an approximately triangular vertical cross section along the longitudinal direction.

The hole portion **501** extending from the rear surface to the front side is provided on the rear surface of the pressing edge portion **5***a* serving as a connecting side to the main body portion **5***b*. A horizontal cross section of the hole portion **501** has a triangular shape matching the triangular shape of the leading end of the protruding tip **191**.

The vertical width of the hole portion **501** is approximately uniform to match the vertical width of the protruding

tip **191** so as to receive the inserted protruding tip **191**. The hole portion **501** has a horizontal bottom surface continuous to the upper surface of the main body portion **5***b* so as to allow the protruding tip **191** to be smoothly inserted.

The crossbar portion **5***c* bridged between the right and left tape guides **51** and **52** is provided over the rear end of the main body portion **5***b*. As the protruding tip **191** is inserted into the hole portion **501**, the crossbar portion **5***c* is engaged with the engagement portion **199** described above, so that the transfer head **5** is installed in the base member **19**.

In this case, the fourth portion **198** is pressed by the crossbar portion **5***c*. As a result, disengagement of the transfer head **5** from the base member **19** is prevented.

Note that, according to the another embodiment, similarly, the front end of the hole portion **501** may be placed in the vicinity of the pressing edge portion **5***a*. Specifically, the distance dl between the front end of the pressing edge portion **5***a* of the transfer head **5** and the front end of the protruding tip **191** may be set to 0.3 mm to 8 mm, and may be set to 0.5 mm to 4 mm when the protruding tip **191** is inserted into the hole portion **501**. By arranging the front end of the protruding tip **191** in this manner, it is possible to reliably transmit the pressing force to the pressing edge portion **5***a* when the transfer head **5** is pressed by the protruding tip **191**.

Unlike the first described embodiment, the transfer head **5** is not pivoted about the base member **19** according to the another embodiment. However, similar to the first described embodiment, as a force is applied to the casing **2** such that the pressing edge portion **5***a* of the transfer head **5** is pressed to the transfer target surface in the event of a transfer, the protruding tip **191** presses the inner surface of the hole portion **501** downward, so that a part of the area including the center of the left-right direction of the main body portion is pressed. As a result, a state in which the coating film is not transferred in the center of the coating film is not easily generated. In addition, cracking in the transferred coating film or chipping of the coating film during writing is not easily generated.

While embodiments according to the invention have been described hereinbefore, the invention is not limited thereto. For example, the shapes of the protruding tip and the hole portion are not limited to those of the embodiments. For example, they may have another pivotable configuration relationship in which the protruding tip has a circular columnar shape, and the hole portion has a shape matching the circular columnar shape. As a non-pivotable structure, the protruding tip may have a rectangular parallelepiped shape, a triangular prism shape, or the like.

One or more embodiments of the present invention may be to provide a convenient coating film transfer tool capable of preventing a state in which a coating film is not transferred in the center of the coating film in a pressing edge portion of a transfer head.

In one or more embodiments of the present invention, a coating film transfer tool **1** may include: a casing **2** that houses a feeding reel **4** around which a transferable tape **3** before transferring a coating film is wound and a winding reel **6** that winds the transferable tape **3** after transferring the coating film; and a transfer head **5** having a main body portion **5***b* arranged in a front side which is one side of a longitudinal direction of the casing **2** to extend in a left-right direction perpendicular to the longitudinal direction in a front end portion and provided with a pressing edge portion **5***a* for transferring the coating film to a transfer target surface. The casing **2** or a base member **19** housed in the casing **2** has a protruding tip **191** that extends to the transfer head **5** side. The protruding tip **191** presses a part of an area including a center of the left-right direction of the main body portion **5***b* to the transfer target surface side in the event of a transfer.

One or more of embodiments of the present invention may include one or more of the following features:

1 Coating film transfer tool
2 Casing
3 Transferable tape
4 Feeding reel
5 Transfer head
5*a* Pressing edge portion
5*b* Main body portion
5*c* Crossbar portion
6 Winding reel
19 Base member
21 Upper casing member
22 Lower casing member
50 Tape guide
51 Right tape guide
51*d* Lower tape guide
51*u* Upper tape guide
52 Left tape guide
52*d* Lower tape guide
52*u* Upper tape guide
191 Protruding tip
192 Protrusion
501 Hole portion

The disclosure set forth above may encompass multiple distinct inventions with independent utility. Although each of these inventions has been disclosed in its preferred form(s), the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense, because numerous variations are possible. To the extent that section headings are used within this disclosure, such headings are for organizational purposes only. The subject matter of this disclosure includes all novel and nonobvious combinations and subcombinations of the various elements, features, functions, and/or properties disclosed herein. The claim concepts particularly point out certain combinations and subcombinations regarded as novel and nonobvious. Other combinations and subcombinations of features, functions, elements, and/or properties may be claimed in applications claiming priority from this or a related application. Such claims, whether directed to a different example or to the same example, and whether broader, narrower, equal, or different in scope to the original claims, also are regarded as included within the subject matter of the present disclosure. Furthermore, explicit reference is hereby made to all embodiments and examples shown in the drawings, whether or not described further herein.

What is claimed is:

1. A coating film transfer tool comprising:

a casing that houses a feeding reel around which a transferable tape before transferring a coating film is wound and a winding reel that winds the transferable tape after transferring the coating film; and

a transfer head having a main body portion arranged in a front side which is one side of a front-rear direction of the casing to extend in a left-right direction perpendicular to the front-rear direction in a front end portion and provided with a pressing edge portion adapted for transferring the coating film to a transfer target surface,

wherein the casing or a base member housed in the casing has a protruding tip that extends to the transfer head side and is connected to the transfer head, and

wherein the protruding tip is configured to press a central part of the main body portion toward the transfer target surface side in the event of a transfer.

2. The coating film transfer tool according to claim **1**, wherein a hole portion extending from a rear side to a front side of the longitudinal direction is provided in the central part of the main body portion, and

the protruding tip is inserted into the hole portion.

3. The coating film transfer tool according to claim **2**, wherein the transfer head is pivotable about the protruding tip.

4. The coating film transfer tool according to claim **3**, wherein a front end of the protruding tip extends to a vicinity of the pressing edge portion.

5. The coating film transfer tool according to claim **4**, wherein a distance between a front end of the pressing edge portion of the transfer head and the front end of the protruding tip is set to 0.3 mm to 8 mm.

6. The coating film transfer tool according to claim **5**, wherein an extending direction of the pressing edge portion is perpendicular to rotation shafts of the feeding reel and the winding reel.

7. The coating film transfer tool according to claim **6**,

wherein the transfer head has a pair of tape guides arranged in left and right sides of the main body portion,

each of the pair of tape guides has

a lower tape guide arranged in a side where the transferable tape before transferring the coating film passes in the main body portion, and

an upper tape guide arranged in a side where the transferable tape after transferring the coating film passes in the main body portion, and

a gap between the pair of the upper tape guides is wider than a narrowest gap between the pair of the lower tape guides.

8. The coating film transfer tool according to claim **1**, wherein the transfer head is pivotable about the protruding tip.

9. The coating film transfer tool according to claim **1**, wherein a front end of the protruding tip extends to a vicinity of the pressing edge portion.

10. The coating film transfer tool according to claim **1**, wherein a distance between a front end of the pressing edge portion of the transfer head and the front end of the protruding tip is set to 0.3 mm to 8 mm.

11. The coating film transfer tool according to claim **1**, wherein an extending direction of the pressing edge portion is perpendicular to rotation shafts of the feeding reel and the winding reel.

12. The coating film transfer tool according to claim **1**,

wherein the transfer head has a pair of tape guides arranged in left and right sides of the main body portion,

each of the pair of tape guides has

a lower tape guide arranged in a side where the transferable tape before transferring the coating film passes in the main body portion, and

an upper tape guide arranged in a side where the transferable tape after transferring the coating film passes in the main body portion, and

a gap between the pair of the upper tape guides is wider than a narrowest gap between the pair of the lower tape guides.

13. A coating film transfer tool comprising:

a casing that houses a feeding reel around which a transferable tape before transferring a coating film is wound and a winding reel that winds the transferable tape after transferring the coating film; and

a transfer head having a main body portion arranged in a front side which is one side of a front-rear direction of the casing to extend in a left-right direction perpendicular to the front-rear direction in a front end portion and provided with a pressing edge portion adapted for transferring the coating film to a transfer target surface,

wherein the casing has a protruding tip that extends to the transfer head side and is connected to the transfer head, and

wherein the protruding tip is configured to press a central part of the main body portion toward the transfer target surface side in the event of a transfer.

14. The coating film transfer tool according to claim **13**, wherein a hole portion extending from a rear side to a front side of the longitudinal direction is provided in the central part of the main body portion, and the protruding tip is inserted into the hole portion.

15. The coating film transfer tool according to claim **13**, wherein the transfer head is pivotable about the protruding tip.

16. The coating film transfer tool according to claim **13**, wherein a front end of the protruding tip extends to a vicinity of the pressing edge portion.

17. A coating film transfer tool comprising:

a casing that houses a feeding reel around which a transferable tape before transferring a coating film is wound and a winding reel that winds the transferable tape after transferring the coating film; and

a transfer head having a main body portion arranged in a front side which is one side of a front-rear direction of the casing to extend in a left-right direction perpendicular to the front-rear direction in a front end portion and provided with a pressing edge portion adapted for transferring the coating film to a transfer target surface,

wherein a base member housed in the casing has a protruding tip that extends to the transfer head side and is connected to the transfer head, and

wherein the protruding tip is configured to press a central part of the main body portion toward the transfer target surface side in the event of a transfer.

18. The coating film transfer tool according to claim **17**, wherein a hole portion extending from a rear side to a front side of the longitudinal direction is provided in the central part of the main body portion, and the protruding tip is inserted into the hole portion.

19. The coating film transfer tool according to claim **17**, wherein the transfer head is pivotable about the protruding tip.

20. The coating film transfer tool according to claim **17**, wherein a front end of the protruding tip extends to a vicinity of the pressing edge portion.

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